

ITEMS 010700

Item 0107001 - 12" WHITE PAINTED PAVEMENT MARKINGS

Item 0107002 - 4" YELLOW PAINTED PAVEMENT MARKINGS

Item 0107003 - 4" WHITE PAINTED PAVEMENT MARKINGS

Item 0107004 - WHITE PAINTED PAVEMENT DIRECTIONAL MARKINGS

DESCRIPTION

These items shall include furnishing materials, labor, tools and equipment to install yellow and/or white fast drying painted pavement line and/or directional markings at locations indicated on the plans or where ordered by the Engineer and in conformance with the plans and these specifications.

The Contractor shall notify the Engineer when he has obtained materials required for the line markings, and any material found to be defective or damaged, upon its inspection by the Engineer, will be rejected.

REFERENCED ITEMS

None

REQUIRED SUBMITTALS

Material Certificate of Compliance:

Submit 5 copies of material certificate of compliance for paint in accordance with the contract general requirements.

Certified Test Report:

Submit 5 copies of certified test reports for paint and glass spheres in accordance with the contract general requirements.

MATERIALS

1. **TYPE OF PAINTS**

This specification covers a ready-mixed paint product of spraying consistency, which shall be suitable for use as paint for providing a reflecting traffic guide on Portland cement concrete or bituminous pavement. The paint may be of the following types:

A white type in which glass spheres are dropped into the wet paint by suitable means as it is applied by the pavement marker.

A yellow type in which glass spheres are dropped into the wet paint by suitable means as it is applied by the pavement marker.

2. METHODS OF TESTING

The methods of sampling and testing all materials and products covered by this specifications shall be in accordance with the latest standards of the ASTM, the AASHTO, the Federal Government or of other recognized standardizing agencies as indicated for each material. No additional solvents or thinners will be added or permitted at the time of application.

3. CONDITION AND STABILITY

The paint shall be homogeneous, shall be well mixed to a uniform, smooth consistency, shall not skin nor settle badly, nor cake, liver, thicken, curdle or gel in the container. The paint shall be tested in accordance with ASTM Designation D-869-85, and a paint rated below 4 shall be considered unsatisfactory.

4. FOREIGN MATTER

The paint shall be free from sand, dirt and other foreign matter and shall contain not more than 1/2 percent water. The paint shall be tested in accordance with Methods 4081, 4091, and 4092.1 of Federal Test Method No. 141

5. FORMULATION AND MANUFACTURING

The paint shall be formulated and manufactured from first grade raw materials and shall be free from defects and imperfections that might adversely affect the serviceability of the finished product. The materials shall show no settling or jellying that will affect the performance of the product. The paint shall provide the proper anchorage, refraction, and reflection for the finished glass spheres when applied as specified. No additional thinner shall be added.

6. SUITABILITY TO APPLICATION

The paint shall be suited to application by means of spray-type pavement marking equipment and when used with such equipment shall be capable of producing a solid, full-width line of required thickness.

7. DRYING TIME

White or yellow paint, when applied to a clean plate glass panel at a wet film thickness of .015+/-0.0005 inches, temperature 77 F, and relative humidity 50 to 60 percent, shall dry to no-pick-up in 15 minutes using the drying time wheel designated by ASTM D-711-89. The test shall be run without beads.

In addition to meeting the drying requirements, the paint, when applied to the road at .015 inches wet film thickness with beads dropped on at the rate of six pounds per gallon of paint, shall dry to no-pick up in no more than 15 minutes.

8. VISCOSITY

As received, the white paint shall have a consistency as determined on the Stormer Viscosimeter of 70 to 80 Krebs Units at 77 F, and the yellow paint shall have a consistency of 70 to 80 Krebs Units at 77 F (ASTM Designation D-562-01). The viscosity of all paint purchased shall be within +/- 3 Krebs Units of that of the bid sample throughout the production of the entire order, providing the range is within the specified limits.

9. FLEXIBILITY AND WATER-RESISTANCE

The paint shall pass the flexibility and water-resistance tests specified in Federal Specifications TT-P-115D.

10. SKINNING TEST

The paint shall not skin over within 48 hours in a three-quarter-filled, closed, one-pint friction-top tinned can.

11. COLOR

The white paint shall have a daylight reflection (apparent reflectivity) of not less than 85 percent relative to magnesium oxide. Daylight reflection shall be

determined in accordance with Method 6121 of Federal Test Method Standard No. 141.

The yellow paint shall conform to Federal Highway Administration Standard Yellow (green to red tolerance), Federal Standard 595. The paint shall not contain any organic coloring matter and shall not discolor in sunlight.

12. BLEEDING

When tested and evaluated on both tar and asphalt substrates in accordance with the Method of Laboratory Test for Degree of Resistance of Traffic Paint to Bleeding, ASTM Designation 969-85, and the Method of Evaluation Degree of Resistance of Traffic Paint to Bleeding, ASTM Designation D-868-85, the numerical rating of degree of bleeding for both white and yellow paints shall be not less than 4.

13. HIDING POWER (DRY OPACITY)

At a spreading rate of 640 square feet per gallon, the contrast ratio shall be not less than 0.96 for white paint and shall be not less than 0.96 for yellow paint. The dry opacity shall be determined in accordance with Method 4121 of Federal Test Method Standard No. 141. Use Section 4.2 Procedure B - Doctor Blade Application and Section 4.2.4.2, Method B, Dry Film. The use of the suction box is to be omitted in this test. Polished plate glass takes a satisfactory surface.

WHITE PAINT:

	<u>Paint Composition</u>	
	<u>Min.</u>	<u>Max.</u>
Pigment	58%	-----
Vehicle	-----	42%

The weight per gallon shall be not less than 12.8 lbs. The percent nonvolatile vehicle shall be not less than 30 percent.

	<u>Pigment Composition</u>	
	<u>Min.</u>	<u>Max.</u>

Titanium Dioxide	32%	-----
Calcium Carbonate	58%	62%
Magnesium Silicate	8%	12%

Titanium Dioxide shall be rutile type, meeting ASTM Designation D-476-00, Type II. It shall be of domestic origin. Calcium Carbonate shall be natural, non-reactive, low-oil-absorption product with a minimum Ca CO₃ content of 94 percent.

Magnesium Silicate shall be Asbestine 3X or Nytal 200 for better solvent release.

Vehicle solids shall be in compliance with Federal Specification TT-R-266, Type III.

At the manufacturer's discretion, sufficient highly volatile thinners, driers, antiskinning and antissettling agents (Bentone 11 or Aluminum Stearate) shall be added to meet the specified drying time and stability requirements in the vehicle and paint.

YELLOW PAINT:

Paint Composition

	<u>Min.</u>	<u>Max.</u>
Pigment	50%	-----
Vehicle	-----	50%

Coarse particles retained by a 325-mesh sieve shall be not greater than 1.0 percent. The weight per gallon shall be not less than 11.4 lbs.

Pigment Composition

	<u>Min.</u>	<u>Max.</u>
Medium Chrome Yellow (87% Grade)	26%	30%
Titanium Dioxide (92% Grade)	12%	16%

Inert or Extending Pigments	54%	62%
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Medium Chrome Yellow shall conform to Federal Specification TT-P-346b, Type III. Titanium Dioxide shall be rutile type, conforming to ASTM Designation D-476-00, Type II and shall be of domestic origin. Extending pigments shall be fibrous magnesium silicate and/or diatomaceous silica. No calcium carbonate or calcium sulfate will be permitted.

Vehicle solids shall be in compliance with Federal Specification TT-R-266, Type III.

At the manufacturer's discretion, sufficient highly volatile thinners, driers, antiskinning and antisetling agents shall be added to meet the specified drying time and stability requirements in the vehicle and paint.

14. **CERTIFICATE OF COMPLIANCE**

The manufacturer shall submit for each bid item a Certificate of Compliance certifying that the bid item meets all the requirements in this specification.

CONSTRUCTION METHODS

Pavement areas to be painted shall be dry and sufficiently cleaned of sand and road debris so as to provide an acceptable bond between the paint and the pavement.

Paint shall be applied at a rate of 100 square feet to 155 square feet per gallon with glass beads applied at a rate of six pounds per gallon of paint for painted pavement markings and painted legend, arrows, and markings, and eight pounds per gallon of paint for fast-drying painted pavement markings.

Fast-drying paint shall be applied at a temperature of 120 F to 150 F at the spray gun.

All painting shall be performed in a neat and workmanlike manner. The lines shall be sharp and clear with no feathered edging or fogging and precautions shall be taken to prevent tracking by tires of the striping equipment. Paint shall be applied parallel to the roadway centerline or as shown on the plans with no unsightly deviations.

After application, the paint shall be protected from crossing vehicles for a time at least equivalent to the drying time of the paint.

The Engineer will furnish the layout of the pavement marking and the Contractor shall be responsible for the exact location on the field.

METHOD OF MEASUREMENT

This work will be measured for payment at the contract unit price per linear foot or square foot for "PAINTED PAVEMENT MARKINGS" of the color and width specified, complete in place, and accepted by the Engineer. Price shall include all materials, equipment, tools and labor incidental thereto.

BASIS OF PAYMENT

This work will be paid for at the contract unit price per linear foot or square foot for "PAINTED PAVEMENT MARKINGS" of the color and width specified, completed in place, and accepted by the engineer. Price shall include all materials, equipment, tools and labor incidental thereto.

<u>PAY ITEM</u>	<u>DESCRIPTION</u>	<u>PAY UNIT</u>
0107001	12" White Painted Pavement Markings	LF
0107002	4" Yellow Painted Pavement Markings	LF
0107003	4" White Painted Pavement Markings	LF
0107004	White Painted Pavement Directional Markings	SF